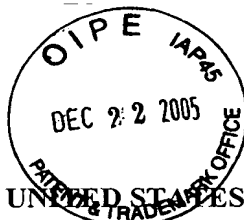


Docket No. 278432US0PCT



IAP4 Rec'd PCT/PTO 22 DEC 2005
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PCT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Naohiko HIROTA, et al.

SERIAL NO: 10/550,528

GAU:

FILED: September 22, 2005

EXAMINER:

FOR: BARLEY LIPOXYGENASE 1 GENE, METHOD OF SELECTING BARLEY VARIETY, MATERIAL OF MALT ALCOHOLIC DRINKS AND PROCESS FOR PRODUCING MALT ALCOHOLIC DRINK

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR 1.97

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

Applicant(s) wish to disclose the following information.

REFERENCES

- ☒ The applicant(s) wish to make of record the references listed on the attached form PTO-1449. Copies of the listed references are attached, where required, as are either statements of relevancy or any readily available English translations of pertinent portions of any non-English language references.
- ☐ A check or credit card payment form is attached in the amount required under 37 CFR §1.17(p).

RELATED CASES

- ☐ Attached is a list of applicant's pending application(s), published application(s) or issued patent(s) which may be related to the present application. In accordance with the waiver of 37 CFR 1.98 dated September 21, 2004, copies of the cited pending applications are not provided. Cited published and/or issued patents, if any, are listed on the attached PTO form 1449.
- ☐ A check or credit card payment form is attached in the amount required under 37 CFR §1.17(p).

CERTIFICATION

- ☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement.
- ☐ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the undersigned, having made reasonable inquiry, was known to any individual designated in 37 CFR §1.56(c) more than three months prior to the filing of this statement.

DEPOSIT ACCOUNT

- ☒ Please charge any additional fees for the papers being filed herewith and for which no check or credit card payment is enclosed herewith, or credit any overpayment to deposit account number 15-0030. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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Form PTO 1449
(Modified)U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICEATTY DOCKET NO.
278432US0PCTSERIAL NO.
10/550,528

LIST OF REFERENCES CITED BY APPLICANT

APPLICANT

Naohiko HIROTA, et al.

FILING DATE

September 22, 2005

GROUP

U.S. PATENT DOCUMENTS

EXAMINER ✓ INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	AA						
	AB						
	AC						
	AD						
	AE						
	AF						
	AG						
	AH						
	AI						
	AJ						

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
	AK	02/053720	07/11/02	WO		NO

OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, etc.)

	AL	KURODA et al. "Characterization of Factors that Transform Linoleic Acid into Di- and Trihydroxyoctadecenoic Acids in Mash", Journal of Bioscience and Bioengineering, vol. 93, no. 1, pages 73-77 2002				
	AM	SHIBATA et al. "Plant Lipoxygenases", J. Lipid Mediators Cell Signalling, vol. 12, pages 213-228 1995				
	AN	DROST et al. "Flavor Stability", ASBC Journal, vol. 48, no. 4, pages 124-131 1990				
	AO	VILARINHOS et al. "Use of the Random Amplified Polymorphic DNA Technique to Characterize Soybean (Glycine max (L.) Merrill) Genotypes", Rev. Brasil. Genet., vol. 17, no. 3, pages 287-290 1994				
	AP	HESSLER et al. "Association of a Lipoxygenase Locus, Lpx-B1, with Variation in Lipoxygenase Activity in Durum Wheat Seeds", Crop Science, vol. 42, pages 1695-1700 2002				
	AQ	KOBAYASHI et al. "The Production of Linoleic and Linolenic Acid Hydroperoxides during Mashing", Journal of Fermentation and Bioengineering, vol. 76, no. 5, pages 371-375 1993				
	AR	KOBAYASHI et al. "A New Method for Evaluating Foam-Damaging Effect by Free Fatty Acids", J. Am. Soc. Brew. Chem., vol. 60, no. 1, pages 37-41 2002				
	AS	KANEDA et al. "Adsorption to or Desorption of Beer Components from a Lipid Membrane Related to Sensory Evaluation", Journal of Bioscience and Bioengineering, vol. 92, no. 3, pages 221-226 2001				
	AT	YASUI. Journal of the Brewing Society of Japan, vol. 96, pages 94-99 2001				<input type="checkbox"/> Additional References sheet(s) attached

Examiner

Date Considered

*Examiner: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



U.S. PCT Application Serial No.: 10/550,528
Docket No.: 278432US0PCT

STATEMENT OF RELEVANCY

- 1) References AK-AP have been cited in the International Search Report. Copies of these references are being submitted herewith only when not automatically provided by the International Searching Authority.
- 2) References _____ have been cited in the corresponding _____ Search Report. A copy of these references is being submitted herewith.
- 3) References AQ-AT are discussed in the specification. A copy of these references is being submitted here with.
- 4) References _____ are additional prior art known to Applicant. A copy of these references is being submitted herewith.

AT YASUI. Journal of the Brewing Society of Japan, vol. 96, pages 94-99, 2001
The wort producing process comprises the wheat delivering process that ground malt is transferred to a mash tub mixing with warm water, and the protein degrading process that Moromi (unrefined sake) is kept at around 50°C and is resolved into amino acid that yeast can be assimilated with the action of protease. Then, hydroperoxyfatty acid is formed by oxidization of fatty acid with the action of lipoxygenase derived from malt. Hydroperoxyfatty acid is converted into hydroxy fatty acid due to its instability. As described above, it was proved that trihydroxy octadecenoic acid that is oxidative decomposition product of linoleic acid occurred in the early stage of the wort producing is transited into product beer, and is precursor to trans-2-nonenal occurred by heating beer at 100°C (Fig. 1).

Fig. 1

Formation of trans-2-nonenal by oxidation and heating of fatty acid

Lipoxygenase

Linoleic acid

9-hydroperoxy octadecadienoic acid

Heated at 100°C for two hours

9, 10, 11-trihydroxy octadecenoic acid

Trans-2-nonenal